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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/823,116 | 04/12/2004 | Kevin J. Torek | MI22-2559 | 3522 |

21567 7590 04/05/2005
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SPOKANE, WA 99201

EXAMINER

DEO, DUY VU NGUYEN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1765

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,116

Applicant(s)

TOREK ET AL.

Examiner

DuyVu n Deo

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-24 is/are allowed.
- 6) ☒ Claim(s) 7-11, 25-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Harada et al. (US 5,631,868).

Harada describes a method for removing an organic compound such as photoresist from a semiconductor substrate comprising: feeding an feed gas consisting of an oxygen gas (having a purity of at least 99.999%) supplemented with CO or CO₂ through an ozone generator to generate ozone (this feed gas would comprise less than or equal to 0.001% of N₂ because it contains no nitrogen); and contacting the ozone with the resist on the substrate to remove the resist (claim 1; col. 2, line 56-60; col. 7, line 5, line 38-40; col. 9, line 26-30).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada as applied to claim 7 above, and further in view of Ury et al. (US 4,885,047).

Art Unit: 1765

Unlike claimed invention, Harada doesn't describe irradiating at least some of the ozone with UV prior to the contacting. Ury describes a same method of removing resist wherein he teaches of using ozone and irradiating the resist with during the process. Some of the ozone would have to be irradiated with UV to create ozone fragments prior to the contacting and proximate the resist during the process. (col. 4, line 19-39). It would have been obvious for one skill in the art to modify Harada in light of Ury because Ury teaches that UV may provide an enhancement of the stripping time.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada as applied to claim 7 above, and further in view of De et al. (JP411219926A).

Unlike claimed invention, Harada doesn't describe mixing ozone with water vapor prior to contacting. However, removing resist with ozone and water vapor has been known to one skill in the art at the time of the invention such as one taught by De (ab.). Therefore, at the time of the invention one skill in the art would find it obvious to remove resist in light of De by using ozone and water vapor, which would enhances the removal process since water would provide another source of oxidizing agent to remove the photoresist with an anticipation of an expected result.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada as applied to claim 7 above, and further in view of Mullee (US 6,306,564).

Unlike claimed invention, above prior art doesn't describe mixing the ozone with organic solvent vapor prior to the contacting. Mullee describes a method of removing the photoresist wherein the photoresist is removed using a combination of ozone and organic solvent such as

Art Unit: 1765

acetone, isopropanol (col. 4, line 11-30). It would have been obvious for one skill in the art to add organic solvents into the mixture because Mullee teaches that organic solvents would remove organic contaminants from the wafer surface (col. 4, line 22-24).

Mullee describes the chemicals are heated and carried by a gas into the reaction chamber so that less chemical is needed to remove the photoresist (summery; col. 2, line 56-60). This would provide organic solvent vapors.

7. Claims 25-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada, Mullee and further in view of Ury et al. (US 4,885,047).

Unlike claimed invention, above prior art doesn't describe irradiating at least some of the ozone with UV prior to the contacting. Ury describes a same method of removing resist wherein he teaches of using ozone and irradiating the resist with during the process. Some of the ozone would have to be irradiated with UV to create ozone fragments prior to the contacting and proximate the resist during the process. (col. 4, line 19-39). It would have been obvious for one skill in the art to modify above prior art in light of Ury because Ury teaches that UV may provide an enhancement of the stripping time.

8. Nomoto (US 6,133,603) and Dahlheim et al. (US 5,540,047) cited to show prior art.

Allowable Subject Matter

9. Claims 12-24 are allowed because Harada doesn't suggest providing a feeding gas consisting essentially of O₂ and from 0-0.001 % N₂ (by volume) through the ozone generator to generate ozone.

Terminal Disclaimer

10. The terminal disclaimer filed on 1/19/05 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of U.S. Patent No. 6,740,597 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

11. Applicant's arguments filed 1/19/05, concerning claims 7-11, 25-35, has been fully considered but they are not persuasive.

Applicant's argument that Harada discloses providing a feed gas consisting of oxygen supplemented with nitrogen is acknowledged. However, the oxygen can also supplemented with other gases such as CO or CO₂ (claim 1). In this case, the feeding gas would contain less than 0.001 % of N₂ (by volume).

Art Unit: 1765

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-3:30; with alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Primary Examiner

Duy-Vu N. Deo

3/31/05

